Executive Summary, Modal Shift in the Boulder Valley: 1990 to 2003

Background

- The Travel Diary Study is a periodic survey of Boulder Valley residents' travel patterns and mode selection. The initial study was conducted in 1990 to provide baseline information, and has been reimplemented every two to three years since then. The study is designed to provide feedback to City staff and Council members on the effectiveness of City programs aimed at reducing single-occupancy vehicle (SOV) travel, and to provide information on resident travel behaviors useful for future transportation planning.
- 2003 Travel Diary Study is the sixth replication of the survey since the baseline survey. This long trend line is useful in measuring the City's progress towards the 1996 Transportation Master Plan (TMP) SOV modal share target of only 25% of all trips by the year 2020. Achieving an SOV modal share of 25% by the year 2020 would mean a 19% shift in the proportion of SOV trips made from 1990 to 2020. The 2003 TMP objectives include "continued progress toward no growth in long-term vehicle traffic" although the unexpected increase in population and employment seen since 1996 suggests that this will not be achieved by 2020.
- Participants in the 2003 Travel Diary Study were asked to keep a log or "diary" of their travel for one randomly assigned day during the week of September 22nd (or a replacement week if necessary). For every trip made during the 24 hour period, respondents recorded the origin and destination of the travel, the travel mode used, the time of day, the number of people in the vehicle (if applicable), and the number of miles or blocks traversed during the 24 hour period. A trip was defined as any "one-way travel from one point to another that takes you farther than one city block (about 200 yards) from the original location."
- The participants were also asked to complete a survey regarding their household characteristics such as number of vehicles and bicycles present in the household, receipt of deliveries, work location, and other general socioeconomic demographics.
- The 2003 Travel Diary Study results are based on approximately 1,300 randomly selected Boulder Valley residents' records of their travel. About 8,000 households and students in group quarters (e.g., dormitories or Greek houses) were contacted to participate in the study, approximately 1,300 returned travel diaries, resulting in a response rate of about 18%.
- With a sample size of about 1,000 in each study year, the margin of error around the results is ±1.3% per year. Thus, for a difference to be statistically significant between years there must be a shift of at least 2.6% (1.3% around each study year).

Modal Shift of All Trips

- Mode choice or "modal split" can be defined as a method of dividing travel into all available transportation modes and can refer to the number of modes, number of trips or number of miles traveled. This study uses the number of trips and number of miles when calculating modal split, and classifies the modes as single-occupancy vehicle (SOV), multiple-occupancy vehicle (MOV), transit or high-occupancy vehicle, school bus, foot and bicycle trips. A comparison of the mode choices from 1990 to 2003 provides information on modal "shift," that is, the shift of trips or miles traveled from one mode to another for residents in the Boulder Valley.
- In 2003, the modal split of all trips was:
    - Single-Occupancy Vehicle, 39.0%
    - Multiple-Occupancy Vehicle, 23.5%
    - Transit, 4.6%
    - School Bus, 0.3%
    - Bicycle, 14.0%
    - Foot, 18.6%.
- Compared to 1990, there was significant shift in trips in four categories:
    - Single-Occupancy Vehicle, -5.2%
    - Multiple-Occupancy Vehicle, -2.8%
    - Transit, +3.0%
    - Bicycle, +4.9%
- The 2003 TMP has an objective of continued progress toward no long-term growth in vehicle traffic. Given increased population, trips made by those living outside of Boulder, and increasing trip length, the 1996 TMP expected that SOV trips will need to account for no more than 25% of trips made by the year 2020 to meet this VMT goal. To achieve this modal split by 2020, there will need to be a 19% shift away from 1990 SOV trip levels to meet this VMT goal, which translates to an average annual shift of 0.63%, assuming equal progress throughout the thirty-five year span from 1990. The observed modal shift has not quite kept pace with the 1996 TMP goal in recent years.
- Changes in Boulder citizens' travel behavior cannot be solely attributed to the City's interventions, as regional and national transportation trends also impact travel behavior. However, the national trends observed demonstrate little reduction in "privately owned vehicle" (POV) use, which includes both SOVs and MOVs over the study period.
    - Nationwide, there was a 0.6% shift away from trips made via private vehicles (87.6% in 1990, 87.0% in 2001), compared to an 8.0% shift observed in Boulder (70.5% in 1990, 62.5% in 2003).
    - The proportion of trips made on transit remained unchanged nationally, (2.0% in 1990; 1.7% in 2001) while in Boulder there was a 3.0% shift toward public transit (1.6% in 1990; 4.6% in 2003).

- In 2003, the modal split miles for all trips was:
    - Single-Occupancy Vehicle, 44.0%
    - Multiple-Occupancy Vehicle, 39.5%
    - Transit, 5.5%
    - School Bus, 0.2%
    - Bicycle, 7.7%
    - Foot, 3.0%.
- Compared to 1990, there was significant shift in miles in two categories:
    - Single-Occupancy Vehicle, -6.0%
    - Bicycle, +2.8%
- Nationwide, there was a 1.2% shift toward towards miles traveled via private vehicles (93.5% in 1990, 96.5% in 2001), compared to a 6.0% shift away from miles traveled via private vehicles observed in Boulder (87.8% in 1990, 83.5% in 2003).
- The proportion of miles traveled via transit stayed flat nationwide, 1.5% in 1990 to 1.2% in 1995, while in Boulder the percent of miles traveled via transit increased slightly, from 4.1% in 1990 to 5.5% in 2003.

Modal Split of the Work Commute

- In 2003, the modal split of trips for the work commute for Boulder Valley residents was:
    - Single-Occupancy Vehicle, 49.6%
    - Multiple-Occupancy Vehicle, 9.2%
    - Transit, 9.8%
    - School Bus, 0.0%
    - Bicycle, 21.2%
    - Foot, 10.3%.
- Compared to 1990, there was significant shift in work commute trips in three categories:
    - Single-Occupancy Vehicle, -17.0%
    - Transit, +5.8%
    - Bicycle, +10.6%
- In 2003, the modal split of miles traveled for the work commute was:
    - Single-Occupancy Vehicle, 63.6%%
    - Multiple-Occupancy Vehicle, 12.8%
    - Transit, 12.6%
    - School Bus, 0.0%
    - Bicycle, 10.0%
    - Foot, 1.0%.
- Compared to 1990, there was significant shift in work commute miles in two categories:
    - Single-Occupancy Vehicle, -8.3%
    - Bicycle, +5.3%
- Use of a private vehicle for the work trips has remained constant across the U.S., as measured in trips and miles, while Boulder has experienced a decline in work trips made via private vehicles.
- The proportion of work trips made via transit has increased in Boulder, while the nation has seen no change in transit use. When the number of miles traveled for work via transit is examined, Boulder has experienced a net increase from 1990 (11.2%) to 2003 (12.6%), but the

gain is smaller (and not statistically significant) than that observed for trips and more volatile across the study period.

- Telecommuting was defined for respondents as follows: "Employees telecommute when they fulfill their job responsibilities at home by substituting telecommunications (computer, modem and/or telephone) for work-related travel". Respondents were asked whether they had telecommuted on the day assigned to them to record their travel; 12% of respondents said they had done so in 2003.
- Of those who telecommuted, 44% indicated that telecommuting reduced the number of drive alone trips the made that day.
- However, almost all telecommuters made at least one work related trip on their assigned travel day, so telecommuting may not yet be a big replacement of work day trips.

Modal Split of University of Colorado Students

- Student enrollment at the University of Colorado is about 27,000 in the 2003/2004 academic year. Students account for more than 20,000 or about 25% of Boulder Valley residents during the school year. Approximately 7,500 live in the dorms or in the Greek houses and the others live in residential units within the Valley. The modal split for this group is traditionally quite different than the rest of Boulder's population due to the students' high use of alternate modes. In 2003, the modal split of trips for CU students was:
    - Single-Occupancy Vehicle, 26.0%
    - Multiple-Occupancy Vehicle, 17.5%
    - Transit, 9.0%
    - School Bus, 0.7%
    - Bicycle, 15.5%
    - Foot, 31.4%.
- Compared to 1990, there was significant shift in trips in one category:
    - Transit, +7.6%
- In 2003, the modal split of "school" trips for CU students was:
    - Single-Occupancy Vehicle, 13.0%
    - Multiple-Occupancy Vehicle, 1.2%
    - Transit, 16.8%
    - School Bus, 2.1%
    - Bicycle, 22.8%
    - Foot, 44.0%.
- Compared to 1990, there was significant shift in "school" trips in one category:
    - Transit, +14.6%

Trip Characteristics

- The information recorded on the travel diary can be used to characterize the trip-making behavior of Boulder residents:
    - The average number of trips per day per person was 5.5.
    - The average number of miles traveled per day per person was 27.0 miles.
    - The percent of people who did not leave the house on assigned travel day was 5.2%
    - The average estimated trip length was 5.1 miles.
    - The average estimated trip duration in was 15.4 minutes.
- Compared to 1990, Boulder residents are traveling more miles per day (+2.7 miles) and are making longer trips (+1.1 miles).
- Compared to national data, Boulder residents make shorter trips (5.1 miles for Boulder residents compared to 9.9 miles in 2001 for U.S. residents). Trip duration is also shorter for Boulder residents (15.4 minutes) compared to U.S. residents (18.7 minutes).
- The average work commute trip for Boulder residents in 2003 was 6.2 miles in distance and 16.7 minutes in duration. The average work commute for U.S. residents in 2001 was 14.6 miles and 24.8 minutes.
- The proportion of people making at least one trip on the assigned travel day in 2003 by each mode was:
    - Single-Occupancy Vehicle, 56.6%
    - Multiple-Occupancy Vehicle, 40.6%
    - Transit, 11.2%
    - School Bus, 0.8%
    - Bicycle, 23.2%
    - Foot, 34.8%.
- In 2003, 6.2% of respondents reported they had had goods or services delivered to their work or home. Just over 40% of the respondents receiving a delivery felt that the delivery took the place of a drive alone trip.